Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

The list of currently pending claims is presented below.

Claims 1.-128. (Canceled)

Claim 129. (Previously presented) A device comprising:
a first substrate having a surface;
a second substrate having a surface, said first substrate and said second substrate being aligned such that said surface of said first substrate opposes said surface of said second substrate;
a first organic layer attached to said surface of said first substrate, wherein said first organic layer comprises a first recognition moiety; and
a mesogenic layer between said first substrate and said second substrate, said mesogenic layer comprising a plurality of mesogenic compounds.

Claim 130. (Previously presented) The device according to claim **129**, further comprising a second organic layer attached to said second substrate.

Claim 131. (Previously presented) The device according to claim **130**, wherein said second organic layer comprises a second recognition moiety.

Claim 132. (Previously presented) The device according to claim **130**, wherein said first recognition moiety and said second recognition moiety are the same.

Claim 133. (Previously presented) The device according to claim **131**, wherein said first recognition moiety and said second recognition moiety are different.

Claim 134. (Previously presented) The device according to claim **129**, wherein said organic layer comprises a member selected from the group consisting of organosulfur,

organosilanes, amphiphilic molecules, cyclodextrins, polyols, fullerenes and biomolecules.

Claim 135. (Previously presented) The device according to claim **130**, wherein said first organic layer and said second organic layer are different.

Claim 136. (Previously presented) The device according to claim **130**, wherein said first organic layer and said second organic layer are the same.

Claim 137. (Previously presented) The device according to claim **129**, wherein said organic layer comprises a member selected from the group consisting of:

$$(RO)_3\text{–}Si\text{-}R^1\text{–}(X^1)_n$$

wherein,

R is an alkyl group;

R^1 is a linking group between silicon and X^1;

X^1 is a member selected from the group consisting of reactive groups and protected reactive groups; and

n is a number between 1 and 50.

Claim 138. (Previously presented) The device according to claim **137**, wherein R is a member selected from the group consisting of methyl and ethyl groups.

Claim 139. (Previously presented) The device according to claim **137**, wherein R^1 is a member selected from the group consisting of stable linking groups and cleaveable linking groups.

Claim 140. (Previously presented) The device according to claim **139**, wherein R^1 is a member selected from the group consisting of alkyl, substituted alkyl, aryl, arylalkyl, substituted aryl, substituted arylalkyl, saturated cyclic hydrocarbon, unsaturated cyclic hydrocarbon, heteroaryl, heteroarylalkyl, substituted heteroaryl, substituted heteroarylalkyl, heterocyclic, substituted heterocyclic and heterocyclicalkyl groups.

Claim 141. (Previously presented) The device according to claim **139**, wherein R^1 comprises a moiety which is a member selected from group consisting of disulfide, ester, imide, carbonate, nitrobenzyl phenacyl and benzoin groups.

Claim 142. (Previously presented) The device according to claim **139**, wherein R^1 is a member selected from the group consisting of alkyl and substituted alkyl groups.

Claim 143. (Previously presented) The device according to claim **137**, wherein X^1 is a member selected from the group consisting of carboxylic acid, carboxylic acid derivatives, hydroxyl, haloalkyl, dienophile, carbonyl, sulfonyl halide, thiol, amine, sulfhydryl, alkene and epoxide groups.

Claim 144. (Previously presented) A method for detecting an analyte, comprising:

contacting with said analyte a recognition moiety for said analyte, wherein said contacting causes at least a portion of a plurality of mesogens proximate to said recognition moiety to detectably switch from a first orientation to a second orientation upon contacting said analyte with said recognition moiety; and

detecting said second orientation of said at least a portion of said plurality of mesogens, whereby said analyte is detected.

Claim 145. (Previously presented) The method according to claim **144**, wherein said analyte is a member selected from the group consisting of vapors, gases and liquids.

Claim 146. (Previously presented) The method according to claim **145**, wherein said vapor is a member selected from the group consisting of vapors of a single compound and vapors of a mixture of compounds.

Claim 147. (Previously presented) The method of claim **145**, wherein said gas is a member selected from the group consisting of a single gaseous compound and mixtures of gaseous compounds.

Claim 148. (Previously presented) The method of claim **145**, wherein said liquid is a member selected from the group consisting of a single liquid compound, mixtures of liquid compounds, solutions of solid compounds and solutions of gaseous compounds.

Claim 149. (Previously presented) The method according to claim **144**, wherein said recognition moiety comprises a member selected from the group consisting of metal ions, metal-binding ligands, metal-ligand complexes, nucleic acids, peptides, cyclodextrins, acids, bases, antibodies, enzymes and combinations thereof.

Claim 150. (Previously presented) The method according to claim **144**, wherein from about 10 to about 10^8 mesogens undergo said switching for each molecule of analyte interacting with said analyte.

Claim 151. (Previously presented) The method according to claim **144**, wherein from about 10^3 to about 10^6 mesogens undergo said switching.

Claim 152. (Previously presented) The method according to claim **144**, wherein said first orientation is a member selected from the group consisting of uniform, twisted, isotropic and nematic and said second orientation is a member selected from the group consisting of uniform, twisted, isotropic and nematic, with the proviso that said first orientation and said second orientation are different orientations.

Claim 153. (Previously presented) The method according to claim **152**, wherein said detecting is achieved by a method selected from the group consisting of visual observation, microscopy, spectroscopic technique, electronic techniques and combinations thereof.

Claim 154. (Previously presented) The method according to claim **152**, wherein said visual observation detects a change in reflectance, transmission, absorbance, dispersion, diffraction, polarization and combinations thereof, of light impinging on said plurality of mesogens.

Claim 155. (Previously presented) The method according to claim **153**, wherein said microscopy is a member selected from the group consisting of light microscopy, polarized light microscopy, atomic force microscopy, scanning tunneling microscopy and combinations thereof.

Claim 156. (Previously presented) The method according to claim **153**, wherein said spectroscopic technique is a member selected from the group consisting of infrared spectroscopy, Raman spectroscopy, x-ray spectroscopy, visible light spectroscopy, ultraviolet spectroscopy and combinations thereof.

Claim 157. (Previously presented) The method according to claim **153**, wherein said electronic technique is a member selected from the group consisting of surface plasmon resonance, ellipsometry, impedometric methods and combinations thereof.

Claim 158. (Previously presented) A device comprising:

a first substrate having a first surface;

a second substrate having a second surface, said first substrate and said second substrate being aligned such that said first surface opposes said first substrate opposes said second surface of said second substrate;

a first organic layer attached to said first surface, wherein said first organic layer comprises a first recognition moiety which is bound to said first organic layer, interacts with said analyte, and is selected from a peptide, protein, enzyme, and receptor;

a mesogenic layer between said first substrate and said second substrate, said mesogenic layer comprising a plurality of mesogenic compounds.

Claim 159. (Previously presented) The device according to claim **158**, further comprising an interior portion defined as the area between said first surface and said second surface, wherein said interior portion allows communication between said analyte and said recognition moiety.

Claim 160. (Previously presented) The device according to claim **158**, wherein said organic layer is a rubbed polymer.

Claim 161. (Previously presented) The device according to claim **158**, wherein said recognition moiety further comprises a biomolecule comprising a member selected from a polysaccharide and a combination of a polysaccharide and a protein.

Claim 162. (Previously presented) The device according to claim **158**, wherein said first organic layer comprises a self-assembled organosulfur or organosilane monolayer bound to said first surface; and wherein said first recognition moiety is bound to said self-assembled monolayer.

Claim 163. (Previously presented) A device for detecting an interaction between an analyte and a first or second recognition moiety, said device comprising:

a first substrate having a first surface;

a first organic layer attached to said first surface, wherein said first organic layer comprises a first recognition moiety which is bound to said first organic layer, interacts with said analyte, and is selected from a peptide, protein, enzyme, and receptor; and

a second substrate having a second surface, said first substrate and said second substrate being aligned such that said first surface opposes said second surface;

a second organic layer attached to said first surface, wherein said second organic layer comprises a second recognition moiety, bound to said first organic layer, which interacts with said analyte, wherein said second recognition moiety is selected from an amine, a carboxylic acid, a biomolecule, a drug moiety, a chelating agent, a crown ether, and a cyclodextrin; and

a mesogenic layer between said first substrate and said second substrate, said mesogenic layer comprising a plurality of mesogens, wherein at least a portion of said plurality of mesogens undergo a detectable switch in orientation upon interaction between said first recognition moiety and said analyte, whereby said analyte is detected.

Claim 164. (Previously presented) The device according to claim **163**, wherein said analyte is a member selected from the group consisting of acids, bases, avidin, organic ions, inorganic ions, pharmaceuticals, herbicides, pesticides, agents of war, noxious gases, biomolecules and combinations thereof.

Claim 165. (Previously presented) The device according to claim **163**, wherein said interaction is a member selected from the group consisting of covalent bonding, ionic

bonding, hydrogen bonding, van der Waals interactions, repulsive electronic interactions, attractive electronic interactions, hydrophobic interactions, hydrophilic interactions and combinations thereof.

Claim 166. (Previously presented) The device according to claim **163**, wherein said first organic layer comprises a self-assembled organosulfur or organosilane monolayer bound to said first surface; and wherein said first recognition moiety is bound to said self-assembled monolayer.

Claim 167. (Previously presented) The device according to claim **163**, wherein said second organic layer comprises a self-assembled organosulfur or organosilane monolayer bound to said second substrate; and wherein said second recognition moiety is bound to said self-assembled monolayer.

Claim 168. (Previously presented) A device for detecting an interaction between an analyte and a first or second recognition moiety, said device comprising:

a first substrate having a first surface;

a first organic layer attached to said first surface, wherein said first organic layer comprises a first recognition moiety which is bound to said first organic layer, interacts with said analyte, and is selected from a peptide, protein, enzyme, and receptor; and

a second substrate having a second surface, said first substrate and said second substrate being aligned such that said first surface opposes said second surface;

a second organic layer attached to said first surface, wherein said second organic layer comprises a second recognition moiety, bound to said first organic layer, which interacts with said analyte, wherein said second recognition moiety is selected from a peptide, protein, enzyme, and receptor; and

a mesogenic layer between said first substrate and said second substrate, said mesogenic layer comprising a plurality of mesogens, wherein at least a portion of said plurality of mesogens undergo a detectable switch in orientation upon interaction between said first recognition moiety and said analyte, whereby said analyte is detected.

Claim 169. (Previously presented) The device according to claim **168,** wherein said analyte is a member selected from the group consisting of acids, bases, avidin, organic ions, inorganic ions, pharmaceuticals, herbicides, pesticides, agents of war, noxious gases, biomolecules and combinations thereof.

Claim 170. (Previously presented) The device according to claim **168,** wherein said interaction is a member selected from the group consisting of covalent bonding, ionic bonding, hydrogen bonding, van der Waals interactions, repulsive electronic interactions, attractive electronic interactions, hydrophobic interactions, hydrophilic interactions and combinations thereof.

Claim 171. (Previously presented) The device according to claim **168,** wherein said first organic layer comprises a self-assembled organosulfur or organosilane monolayer bound to said first surface; and wherein said first recognition moiety is bound to said self-assembled monolayer.

Claim 172. (Previously presented) The device according to claim **168,** wherein said second organic layer comprises a self-assembled organosulfur or organosilane monolayer bound to said second substrate; and wherein said second recognition moiety is bound to said self-assembled monolayer.

Claim 173. (Previously presented) A device for detecting an interaction between an analyte and a first or second recognition moiety, said device comprising:

a first substrate having a first surface;

a first organic layer attached to said first surface wherein said first organic layer comprises a first recognition moiety which is bound to said first organic layer and interacts with said analyte; and

a second substrate having a second surface, said first substrate and said second substrate being aligned such that said first surface opposes said second surface;

a second organic layer attached to said first surface, wherein said second organic layer comprises a second recognition moiety which is bound to said second organic layer and interacts with said analyte; and

a mesogenic layer between said first substrate and said second substrate, said mesogenic layer comprising a plurality of mesogens, wherein at least a portion of said plurality of mesogens undergo a detectable switch in orientation upon interaction between said first recognition moiety and said analyte, whereby said analyte is detected.

Claim 174. (Previously presented) The device according to claim **173**, wherein said analyte is a member selected from the group consisting of acids, bases, avidin, organic ions, inorganic ions, pharmaceuticals, herbicides, pesticides, agents of war, noxious gases, biomolecules and combinations thereof.

Claim 175. (Previously presented) The device according to claim **173**, wherein said interaction is a member selected from the group consisting of covalent bonding, ionic bonding, hydrogen bonding, van der Waals interactions, repulsive electronic interactions, attractive electronic interactions, hydrophobic interactions, hydrophilic interactions and combinations thereof.

Claim 176. (Previously presented) The device according to claim **173**, wherein said first organic layer comprises a self-assembled organosulfur or organosilane monolayer bound to said first surface; and wherein said first recognition moiety is bound to said self-assembled monolayer.

Claim 177. (Previously presented) The device according to claim **173**, wherein said second organic layer comprises a self-assembled organosulfur or organosilane monolayer bound to said second substrate; and wherein said second recognition moiety is bound to said self-assembled monolayer.

Claim 178. (Previously presented) The device according to claim **173**, wherein said first organic layer comprises a self-assembled organosulfur or organosilane monolayer bound to said first surface; and wherein said first recognition moiety is bound to said self-assembled monolayer.

Claim 179. (Previously presented) A device comprising:

a first substrate having a surface, wherein said surface comprises a recognition moiety, and said recognition moiety and said first substrate are joined through a member selected from direct attachment and indirect attachment through a spacer arm;

a mesogenic layer oriented on said surface; and

an interface between said mesogenic layer and a member selected from the group consisting of gases, liquids, solids and combinations thereof.

Claim 180. (Previously presented) The device of claim **179**, wherein said recognition moiety and said first substrate are joined through direct attachment, and said direct attachment is through a member selected from covalent bonding, ionic bonding, chemisorption, physisorption and combinations thereof.

Claim 181. (Previously presented) The device of claim **179**, wherein said recognition moiety and said first substrate are joined through indirect attachment through a spacer arm, and wherein said spacer arm comprises a member selected from the group consisting of poly(ethyleneglycol), poly(propyleneglycol), diamines, and surface-active agents.

Claim 182. (Previously presented) A device comprising:

a first substrate having a surface, wherein said surface comprises a recognition moiety, and said recognition moiety and said first substrate are joined through a member selected from direct attachment and indirect attachment through a spacer arm;

a second substrate having a second surface, said first substrate and said second substrate being aligned such that said first surface opposes said second surface;

a mesogenic layer oriented on said surface; and

an interface between said mesogenic layer and a member selected from the group consisting of gases, liquids, solids and combinations thereof.

Claim 183. (Previously presented) The device of claim **182**, wherein said recognition moiety and said first substrate are joined through direct attachment, and said direct attachment is through a member selected from covalent bonding, ionic bonding, chemisorption, physisorption and combinations thereof.

Claim 184. (Previously presented) The device of claim **182,** wherein said recognition moiety and said first substrate are joined through indirect attachment through a spacer arm, and wherein said spacer arm comprises a member selected from the group consisting of poly(ethyleneglycol), poly(propyleneglycol), diamines, and surface-active agents.

Claim 185. (Previously presented) A method for measuring the affinity of a recognition moiety for an analyte of interest over a pre-bound analyte, said method comprising:

(a) contacting a first analyte with a recognition moiety for said first analyte, thus forming a pre-bound analyte

wherein said contacting causes at least a portion of a plurality of mesogens proximate to said recognition moiety to detectably switch from a first orientation to a second orientation upon contacting said first analyte with said recognition moiety;

(b) detecting said second orientation of said at least a portion of said plurality of mesogens;

(c) contacting said analyte of interest with said recognition moiety, wherein said contacting causes at least a portion of a plurality of mesogens proximate to said recognition moiety to detectably switch from the second orientation to a third orientation upon contacting said analyte of interest with said recognition moiety; and

(d) detecting the third orientation of said at least a portion of said plurality of mesogens, whereby the affinity of the recognition moiety for the analyte of interest over the pre-bound analyte is measured.

Claim 186. (Previously presented) A device for amplifying an interaction between a first recognition moiety and an analyte of interest, said device comprising:

a first substrate having a surface;

a first organic layer attached to said surface of said first substrate;

wherein said first recognition moiety is capable of interacting with an analyte of interest to form a first recognition moiety-analyte of interest complex; and

a mesogenic layer comprising a liquid crystalline material, wherein said mesogenic layer is in contact with said first recognition moiety, and the formation of said complex induces a rearrangement in a conformation of said mesogenic layer, and wherein said mesogenic layer amplifies said interaction.

Claim 187. (Previously presented) The device of claim **186**, wherein the first recognition moiety is an antibody.

Claim 188. (Previously presented) The device of claim **186**, wherein the analyte of interest is selected from a biomolecule, chemical warfare agent, and noxious gas.

Claim 189. (Previously presented) The device of claim **186**, wherein said rearrangement of said mesogenic layer produces an optical signal.

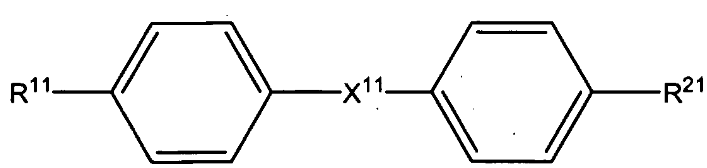
Claim 190. (Previously presented) A copper(II)-detecting device comprising:

a first substrate having a surface;

a second substrate having a surface, said first substrate and said second substrate being aligned such that said surface of said first substrate opposes said surface of said second substrate;

a first organic layer attached to said surface of said first substrate, wherein said first organic layer comprises a first recognition moiety; and

a mesogenic layer comprising a plurality of mesogenic compounds comprising a structure according to Formula X:



(X)

wherein

X^{11} is a member selected from a bond, Schiff bases, diazo compounds, azoxy compounds, nitrones, alkenes, alkynes, and esters;

R^{11} and R^{21} are members independently selected from substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted heterocycloalkyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, acyl, halogens, hydroxy, cyano, amino, alkoxy, mercapto, thia, and aza;

wherein at least one of said R^{11} and R^{21} is cyano.

Claim 191. (Previously presented) The copper(II)-detecting device of claim **190**, wherein X^{11} is a bond, R^{21} is pentyl, and R^{11} is cyano.

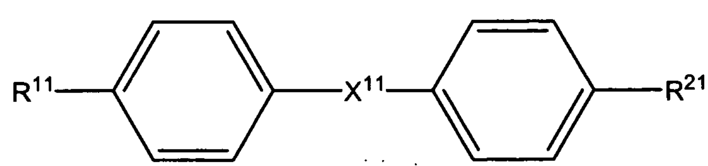
Claim 192. (Previously presented) A sodium-detecting device comprising:

a first substrate having a surface;

a second substrate having a surface, said first substrate and said second substrate being aligned such that said surface of said first substrate opposes said surface of said second substrate;

a first organic layer attached to said surface of said first substrate, wherein said first organic layer comprises a first recognition moiety comprising a carboxylic acid moiety; and

a mesogenic layer comprising a plurality of mesogenic compounds comprising a structure according to Formula X:



(X)

wherein

X^{11} is a member consisting of a bond, Schiff bases, diazo compounds, azoxy compounds, nitrones, alkenes, alkynes, and esters;

R^{11} and R^{21} are members independently selected from substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted heterocycloalkyl, substituted or

unsubstituted aryl, substituted or unsubstituted heteroaryl, acyl, halogens, hydroxy, cyano, amino, alkoxy, mercapto, thia, and aza;

wherein at least one of said R^{11} and R^{21} is a member selected from cyano, hydroxy, alkoxy, alkylamine, amine, mercapto, and thia.

Claim 193. (Previously presented) The sodium-detecting device of claim **192**, wherein X^{11} is a member selected from a bond and an alkene.

Claim 194. (Previously presented) The sodium-detecting device of claim **192**, wherein R^{11} is cyano and R^{21} is methoxy.

Claim 195. (Previously presented) The sodium-detecting device of claim **192**, wherein R^{11} is cyano and R^{21} is pentyl.

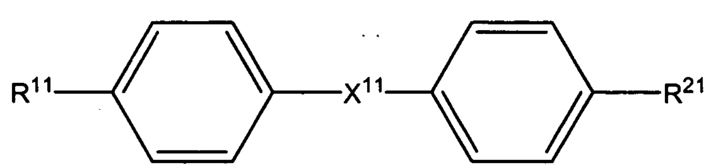
Claim 196. (Previously presented) A hexylamine-detecting device comprising:

a first substrate having a surface;

a second substrate having a surface, said first substrate and said second substrate being aligned such that said surface of said first substrate opposes said surface of said second substrate;

a first organic layer attached to said surface of said first substrate, wherein said first organic layer comprises a first recognition moiety comprising a carboxylic acid moiety; and

a mesogenic layer comprising a plurality of mesogenic compounds comprising a structure according to Formula X:



(X)

wherein

X^{11} is a member consisting of a bond, Schiff bases, diazo compounds, azoxy compounds, nitrones, alkenes, alkynes, and esters;

R^{11} and R^{21} are members independently selected from substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted heterocycloalkyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, acyl, halogens, hydroxy, cyano, amino, alkoxy, mercapto, thia, and aza;

wherein at least one of said R^{11} and R^{21} is a member selected from cyano, hydroxy, alkoxy, alkylamine, amine, mercapto, and thia.

Claim 197. (Previously presented) The hexylamine-detecting device of claim **196**, wherein X^{11} is a member selected from a bond and an alkene.

Claim 198. (Previously presented) The hexylamine-detecting device of claim **196**, wherein R^{11} is cyano and R^{21} is methoxy.

Claim 199. (Previously presented) The hexylamine-detecting device of claim **196**, wherein R^{11} is cyano and R^{21} is pentyl.

Claim 200. (Previously presented) A method of detecting an analyte, comprising:

(a) interacting said analyte with a surface comprising a recognition moiety, thereby forming an analyte-recognition moiety complex, said surface comprising:

(i) a substrate;

(ii) an organic layer bound to said substrate; and

(iii) said recognition moiety bound to said organic layer;

(b) contacting said analyte-recognition moiety complex with a mesogenic layer, thereby causing at least a portion of a plurality of mesogens proximate to said recognition moiety to detectably switch from a first orientation to a second orientation, and

detecting said second orientation of said at least a portion of said plurality of mesogens, whereby said analyte is detected.

Claim 201. (Previously presented) A method of detecting an analyte, comprising:

(a) interacting said analyte with a surface comprising said recognition moiety, said surface comprising:

(i) a substrate;

(ii) an organic layer bound to said substrate; and

(iii) said recognition moiety bound to said organic layer;

(b) contacting said analyte with an organic mesogenic layer, thereby causing at least a portion of a plurality of mesogens proximate to said recognition moiety to detectably switch from a first orientation to a second orientation upon contacting said analyte with said recognition moiety; and

detecting said second orientation of said at least a portion of said plurality of mesogens, whereby said analyte is detected.

Claim 202. (Previously presented) A method for detecting an analyte, comprising:

interacting said analyte and a mesogenic layer, wherein said interacting causes at least a portion of a plurality of mesogens to detectably switch from a first orientation to a second orientation; and

detecting said second orientation of said at least a portion of said plurality of mesogens, whereby said analyte is detected.